OBJECTIVE FORCE WARRIOR: NEW WAYS TO TRAIN

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Introduction

The Objective Force Warrior (OFW) will integrate advancing technologies to enhance the effectiveness of soldiers and small units. The potential of these technologies will only be realized, however, when soldiers, leaders, and units are trained to optimize the capabilities of the new technologies. This article describes Army research, plans, and training guidelines designed to solve the training challenges associated with emerging Objective Force technologies.

Technology Implications

Consider the capabilities and conditions that define the training challenges for Objective Force soldiers and small units. Objective Force soldiers will deploy almost anywhere in the world on very short notice. Increasingly, they will fight in urban and restricted terrains. Compressed timetables and rapidly changing rules of engagement will be the norm. Objective Force units will operate a mix of Legacy, Interim, and Objective Force systems. They must defeat mixes of conventional, unconventional, or nonstate enemy forces and execute stable support operations. To further complicate operations, most missions will be under national and international scrutiny.

The futuristic array of capabilities is considerable. Small-unit communication systems will allow soldiers to condense information from many sources including their immediate environment. New navigation and night vision capabilities will permit greater mobility. Integrated physiological sensors in advanced combat uniforms will provide continuous monitoring of soldier health status and will permit remote medical triage of battlefield casualties. Small units will use organic air and ground robotic capabilities, including scouts and load carriers.

Advanced weapons will permit small units to engage the enemy faster, in greater numbers, and with more focused devastation. New capabilities will allow soldiers to attack close or distant targets from concealed or even remote positions. Soldiers may also use an array of nonlethal capabilities. They will have a greater variety of tools than ever before. They must develop competence and confidence in using the new tools under stress, understand how all the tools interact, and be able to continue the mission when the tools fail. There will be many training challenges.

Future Training Requirements

New technologies will produce obvious and some not-so-obvious demands for more effective and efficient training. Training will increasingly focus on the use of information systems and will, therefore, emphasize cognitive skills in conjunction with psychomotor skills. At all levels, soldiers and leaders must be trained to operate sophisticated information systems. More important, they must be trained to make rapid, accurate decisions with enormous implications on mission success.

Training Guidelines

In recent years, Army science and technology training research taught us much about what we must do to train soldiers to operate complex systems, but significant challenges remain. They include how best to tailor training to OFW technologies, operational conditions, and new training environments. Some specific training guidelines follow.

• *Develop tailorable training.* The goal of training should be to raise the level of proficiency of all soldiers. "One size fits all" training is essentially suboptimal. To maximize efficiency, training should be individually tailored to the knowledge and skill levels of the training population.

• *Ensure soldiers have the prerequisite knowledge and skills.* Increasingly, all soldiers will require basic computer skills. Recently, 36 percent of enlisted personnel in infantry courses rated themselves as computer "novices." OFW-enabled soldiers must master skills that are not taught until the advanced noncommissioned officer level.

• *Develop tools to help leaders train*. Effective trainers must not only be able to use a system, they must be skilled at training. Trainers must be able to diagnose underlying causes of poor performance of both soldiers and equipment. This is difficult with complex systems, especially with an increase in the number of tools and subsystems. For example, while recent advancements such as the thermal weapon sight and aiming light provide extraordinary capabilities, they dramatically increase the number of factors that can cause a soldier to miss a target.

• *Apply demonstrated principles in cognitive skills training*. Research by the U.S. Army Research Institute (ARI), among others, identified effective techniques for training cognitive skills, including learner control, hierarchical sequencing, and the use of advanced organizers.

• *Provide effective, efficient performance feedback*. Performance assessment and feedback mechanisms underpin effective training. Training exercises, especially large collective exercises, provide an experience rather than actual training for small units. Collective live-fire training should account for detailed measures of target hits and task performance. Digital systems should provide new capabilities to permit combat trainers to see how soldiers and leaders are using new technological systems.

• *Develop new "building-block" approaches for collective skills.* New technologies require new strategies to systematically move soldiers through training of individual skills, to buddy

team (pairs), to fire team, to squad. More than ever, the risk of an individual-to-collective training gap is likely. Individual soldiers, or staff elements, may be proficient with a particular system in isolation, but increasingly less effective when other systems are incorporated.

• *Develop training exercises that demonstrate and stress full-system capabilities and limitations.* Soldiers and units must be trained to understand the capabilities and limitations of all of the subsystems and their interrelationships. Soldiers not adequately exposed to all system features are unlikely to use the system well. Collective exercises can be carefully constructed to encourage and reward individuals using optimal combinations of subsystems.

• *Understand the difference between basic proficiency and full mastery.* Developing soldiers and units to fully exploit the technological capabilities of new systems takes time. "Go/no go" standards are generally not appropriate for cognitive tasks. The Army has trained high-performing teams for its warfighting experiments but at an extraordinary cost of resources and stabilization. Moreover, it is increasingly difficult to estimate training resource requirements for new systems. Minimal proficiency may require 8 hours where mastery-level skills needed to exploit technology may require 120 hours.

• *Emphasize training basics.* Practice, practice, practice—with feedback—under increasingly difficult conditions, to include replication of stresses from the expected battlefield.

Training Environments

When people think of training technologies, many focus on the hardware and software of training systems. While these are important, effective training is largely a function of training content, instructional design, and feedback. The following are some considerations for OFW training environments.

• *Embedded training.* The lure of embedded training is great. The logic is that if you have a digital system, you should easily be able to use the system's processing capacity in training. In practice, it is never that simple. Embedded training adds to the complexity of a system, increases system usage and subsequent maintenance, and may not always be available for training (e.g., when locked up in an arms room). Many individuals have advocated the cost-effectiveness of embedded training for some time, but few detailed studies fully validate the approach. Moreover, significant training research challenges remain about what to train and how best to build in sound instructional features. Embedded training, at least in the near term, will more easily address individual and procedural tasks than collective and cognitive tasks. One key to the success of embedded systems will be how well they can incorporate automated performance assessment and feedback.

• *Virtual environments.* Immersive training technologies for dismounted small-unit leaders and soldiers continue to become less expensive and more realistic. Simulating dismounted soldiers walking, talking, and using hand-and-arm signals remains considerably more difficult than simulating mechanized forces. However, progress is being made. In the near term, virtual environments will be most appropriate for training leader skills (e.g., training Objective Force platoon and squad leaders supported by computer-generated forces). The fact that there are 243 rifle squads in a typical infantry division demands that cost-effectiveness and ease of access be fundamental considerations in the development of small-unit virtual environments.

• *Distributed/Web-based training.* Certainly multimedia instruction and Web-based training will play important roles in soldier and small-unit training. Advances in authoring tools, instructional management systems, gaming technologies, and the use of sharable content objects are making quality training development easier and potentially less expensive. The challenge remains in developing scenarios that train more advanced thinking skills. There remains an overarching issue of how to incorporate intelligent feedback, especially for training cognitive skills.

• *Field training.* While each of the mentioned training environments will play a useful and vital role, field training will remain essential. Given the lethality and complexity of systems using emerging OFW technologies, new field training approaches must ensure that all individual-to-collective capabilities can be trained across the full spectrum of operations. This is no simple task. In particular, there is a need for improved performance assessment to help optimize the work of observers and controllers.

Field Trials

Historically, the development of new training approaches and new tactics and fighting techniques has lagged behind the development and fielding of new systems. As a result, the full value of new systems rarely is realized early on. To help the OFW effort avoid that problem, ARI, in conjunction with the U.S. Army Simulation, Training, and Instrumentation Command, plans to develop prototype training methods in parallel with other OFW developments. The new and alternative training methods would be compared and evaluated in a series of field trials using prototype tactics and techniques.

A field-trials approach can provide a highly flexible laboratory for evaluation of alternative training approaches and emerging technologies. The trials will be designed to explore what is possible, practical, and likely. The new training approaches and prototypical fighting techniques will be passed to Army training, combat, doctrine, and materiel developers.

Conclusion

If we are to transform the Army during this decade, we will need validated training approaches that accompany, not trail, the implementation of new warfighting technologies and the tactics they will bring. The training trials would provide an essential link in the path to Army transformation.

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